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CLAIMS

1. A system (20) for applying at least a portion of an authentication mark (26) to a
5 substrate (28) and verifying the application of at least a portion of the mark (26) on the
substrate (28), the substrate (28) being disposed on a production line (24), the system (20)
comprising:
an applicator locatable at the production line (24) and configured and arranged to apply
at least one light-sensitive compound on the substrate (28) to produce at least a portion of the
10 authentication mark (26); and
a verification device (40) locatable at the production line and configured and arranged
to verify application of the at least one light-sensitive compound on the substrate (28).
2. The system (20) according to claim 1, wherein the applicator is a continuous ink jet
printer.
- 15 3. The system (20) according to any one of claims 1 and 2, wherein the applicator is a
printer (22) that prints an ink mixed with the at least one light-sensitive compound.
4. The system (20) according to claim 3, wherein the ink is a water-insoluble ink.
5. The system (20) according to any one of claims 1-4, wherein the verification device
(40) verifies whether a correct light-sensitive compound has been applied.
- 20 6. The system (20) according to any one of claims 1-5, wherein the verification device
(40) irradiates at least the at least one light-sensitive compound with light and detects a first
light response of the at least one light-sensitive compound.
7. The system (20) according to claim 6, wherein the first light response is compared with
a fingerprint.
- 25 8. The system (20) according to any one of claims 3-7, wherein the printer (22) produces
the least a portion of the mark by printing a first ink mixed with a first light-sensitive
compound and a second ink mixed with a second light-sensitive compound with a second ink.

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9. The system (20) according to claim 8 wherein the first and second inks are the same ink.
10. The system (20) according to any one of claims 6-9, wherein the verification device (40) detects a second light response.
- 5 11. The system (20) according to claim 10, wherein the second light response is compared with the fingerprint.
12. The system (20) according to any one of claims 10 and 11, wherein the second light response is different from the first light response.
13. The system (20) according to any one of claims 10-12, wherein the verification device
10 (40) determines a ratio of the first and second responses and compares the ratio to a fingerprint.
14. The system (20) according to any one of claims 3-13, wherein the printer (22) prints the at least one light-sensitive compound mixed with a solvent.
15. The system (20) according to any one of claims 1-14, in combination with the substrate (28).
- 15 16. The combination according to claim 15, wherein the substrate (28) is a product or a product package.
17. The system (20) according to any one of claims 1-16, in combination with the production line (24).
18. The combination according to any one of claims 15-17, wherein the applicator is placed
20 at the production line (24).
19. The combination according to any one of claims 15-18, wherein the verification device (40) is placed at the production line (24).
20. The combination according to any one of claims 15-19, wherein the verification device (40) and the applicator are placed at the production line (24) and wherein the verification
25 device (40) is placed downline of the applicator.

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21. The system (20) according to any one of claims 1-20, further comprising a controller (42) communicating with both the applicator and the verification device (40).

22. The system (20) according to any one of claims 1-21, further comprising an indicator (44) coupled to the verification device (40) and adapted to indicate the verification of at least the portion of the mark (26).
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23. The system (20) according to any one of claims 1-22, further comprising a controller (42) communicating with the verification device (40) and a production line controller.

24. The system (20) according to any one of claims 1-23, wherein the verification device (40) comprises:
10 a frame (50);
a light source (52) mounted to the frame (50), the light source (52) adapted to emit light having a predetermined wavelength to irradiate the at least one light-sensitive compound and the substrate (28); and
an excitation filter (56) mounted to the frame (50) and cooperating with the light source (52) to filter an undesired wavelength of light emitting from the light source (52);
15 wherein the frame (50) and at least one of the light source (52) and the excitation filter (56) are constructed and arranged such that at least one of the light source (52) and the excitation filter (56) is removable from the frame (50) by a user thereby allowing the user to employ at least one of a different light source capable of emitting light having a different
20 predetermined wavelength of light and a different excitation filter capable of filtering a different undesired wavelength of light emitting from the light source.

25. The system (20) according to claim 24, wherein the verification device (40) further comprises an emission filter (60) mounted to the frame (50) and adapted to filter an undesired
25 wavelength of light emitting from at least one of the substrate (28), the at least one light-sensitive compound and ambient light;

wherein the frame (50) and the emission filter (60) are constructed and arranged such that the emission filter (60) is removable from the frame (50) by a user thereby allowing the user to employ a different emission filter capable of filtering a different undesired wavelength

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of light emitting from at least one of the substrate (28), the least one light-sensitive compound and the ambient light.

26. The system (20) according to any one of claims 24 and 25, wherein the verification
5 device (40) further comprises a detector (54) mounted to the frame (50) and adapted to detect light response from the at least one light-sensitive compound.

27. The system according to any one of claims 24-26, wherein the verification device (40)
further comprises an excitation lens (58) mounted to the frame (50) and adapted to focus light
10 emitting from the light source.

28. The system (20) according to claim 27, wherein the frame (50) and the excitation lens
(58) are constructed and arranged such that the excitation lens (58) is removable from the
frame (50) by a user thereby allowing the user to employ a different excitation lens.
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29. The system (20) according to any one of claims 24-28, wherein the verification device
(40) further comprises an emission lens (62) mounted to the frame (50) and adapted to focus
light emitting from at least one of the substrate (28), the least one light-sensitive compound and
the ambient light.
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30. The system according to claim 29, wherein the frame (50) and the emission lens (62)
are constructed and arranged such that the emission lens (62) is removable from the frame (50)
by a user thereby allowing the user to employ a different emission lens.

25 31. A method of applying at least a portion of an authentication mark to a substrate and
verifying the application of at least the portion of the mark, the substrate being disposed on a
production line, the method comprising:

applying at least one light-sensitive compound on the substrate to produce at least the

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portion of the authentication mark (100), the application occurring as the substrate proceeds through the production line; and

verifying application of the at least one light-sensitive compound on the substrate as the substrate proceeds through the production line (106).

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32. The method according to claim 31, wherein verifying application of the at least one light-sensitive compound comprises detecting a light response from the at least one light-sensitive compound as the substrate proceeds through the production line 106.

33. The method according to any one of claims 31 and 32, further comprising packaging
10 the substrate (114) after the substrate has been verified as having a correct mark (106).

34. The method according to any one of claims 31-33, further comprising shipping the substrate (116).

35. The method according to any one of claims 31-34, wherein applying at least one light-sensitive compound to produce the mark comprises mixing a first light-sensitive compound
15 with a first ink.

36. The method according to any one of claims 31-35, wherein verifying the application of the at least one light-sensitive compound comprises irradiating the at least one light-sensitive compound with light and detecting a first light response.

37. The method according to claim 36, wherein the first light response is compared with a
20 fingerprint.

38. The method according to any one of claims 31-37, wherein applying at least one light-sensitive compound to produce at least the portion of the mark comprises mixing a first light-sensitive compound with a first ink and a second light-sensitive compound with a second ink.

39. The method according to claim 38, wherein the first and second inks are the same ink.

25 40. The method according to any one of claims 38 and 39, wherein verifying the application of the at least one light-sensitive compound comprises detecting a second light response from the second light-sensitive compound.

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41. The method according to claim 40, wherein the second light response is compared with a fingerprint.
42. The method according to any one of claims 40 and 41, wherein the second light response is different from the first light response.
- 5 43. The method according to any one of claims 40-42, further comprising obtaining a ratio of the first and second light responses and comparing the ratio to a fingerprint.
44. The method according to any one of claims 31-43, wherein applying at least a portion of the mark comprises mixing the at least one light-sensitive compound with a solvent.
45. The method according to any one of claims 31-44, wherein applying at least a portion
10 of the mark as the substrate proceeds through the production line comprises stopping the substrate during application.
46. The method according to any one of claims 31-44, wherein applying at least a portion of the mark as the substrate proceeds through the production line comprises applying at least a portion of the mark as the substrate moves along the production line.
- 15 47. The method according to any one of claims 31-46, wherein verifying application of the at least one light-sensitive compound as the substrate proceeds through the production line comprises stopping the substrate during verifying.
48. The method according to any one of claims 31-46, wherein verifying application of the at least one light-sensitive compound as the substrate proceeds through the production line
20 comprises verifying as the substrate moves along the production line.